



Chunghwa Picture Tubes, Ltd.

Technical Specification

To : YIH HSING ENTERPRISE CO.,LTD.

Date : 2006.08.12

CPT TFT-LCD

CLAA320WB02 Y

ACCEPTED BY :

APPROVED BY	CHECKED BY	PREPARED BY
	溫文良	TFT-LCD Product Planning Management General Division

Product Planning Management General Division

CHUNGHWA PICTURE TUBES, LTD.

1127 Hopin Rd., Padeh, Taoyuan, Taiwan 334, R.O.C.

TEL: +886-3-3675151 FAX: +886-3-377-3054

Doc.No:	CLAA320WB02 Y-Yih Hsing-Ver1-20060812	Issue Date:	2006/8/12
---------	---------------------------------------	-------------	-----------

T- 3650002- 000- A NEW

RECORD OF REVISIONS

Revision No.	Date	Page	Description
Ver:1	2006/07/17	--	Format reorganized

CONTENTS

[illegible]

1. OVERVIEW

CLAA320WB02P is 32" color (80.04cm) TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, LVDS driver ICs, control circuit, backlight, and inverter. By applying 8 bit digital data, 1366*768, 16.7 million-color images are displayed on the 32" diagonal screen. General specification are summarized in the following table:

1.1 GENERAL INFORMATION

ITEM	SPECIFICATION	UNIT
Display Area	697.68 (H) × 392.25 (V) (31.51 inch diagonal)	mm
Number of Pixels	1366 (H) × 768 (V)	16:9
Pixel Pitch	0.51075 (H) × 0.51075 (V)	mm
Color Pixel Arrangement	RGB Vertical Strip	
Display Mode	Normally Black	
Number of Colors	16.7M (8bit)	color
Surface Treatment	Hard coating: 3H . Anti-Glare Treatment of the front polarizer. < Reflection : 4 % >	
Total Module Power	113(typ)	W

1.2 MECHANICAL INFORMATION

ITEM			MIN	TYP.	MAX.	UNIT
Module outline dimension	Horizontal (H)		759.0	760.0	761.0	mm
	Vertical (V)		449.0	450.0	451.0	mm
	Depth (D)	with inverter	44.0	45.0	46.0	mm
	Module Weight		7600	7800	8000	g

2. ABSOLUTE MAXIMUM RATINGS

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage For LCD	VCC	-0.3	15.0	V	
Input Voltage of Inverter	VBL	-0.3	27.0	V	
Invert Dimming	PDIM	-0.3	3.5	Vdc	
BL on/off	ON/OFF	-0.3	5.5	Vdc	
ESD for Connector	VESD	-250	250	V	
ESD for Module	VESD	-15	15	KV	
Operation Temperature (Surrounding)	T _{op}	0	50		*1) *2) *3) *4)
Storage Temperature	T _{stg}	-20	60		*1) *2) *3) *4)

[Note]

*1) The relative temperature and humidity range are as below sketch, 90%RHMax. (Ta 40)

*2) The maximum wet bulb temperature 39 (Ta > 40) and without dewing.

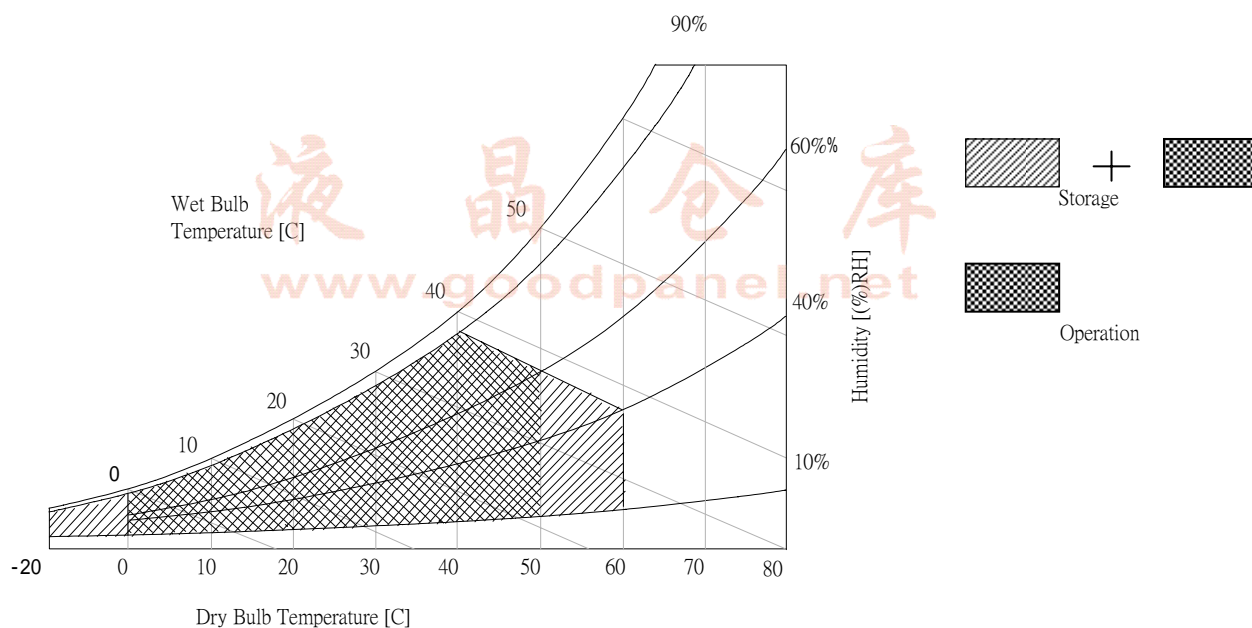
*3) If you use the product in a environment which over the definition of temperature and humidity too long to effect the result of eye-atching.

*4) If you operate the product in normal temperature range, the center surface of panel should be under 60 .

Humidity :

H 85%RH without condensation.

Wet Bulb Temperature 39 (Ta 40)



3. ELECTRICAL CHARACTERISTICS

3.1 TFT-LCD MODULE

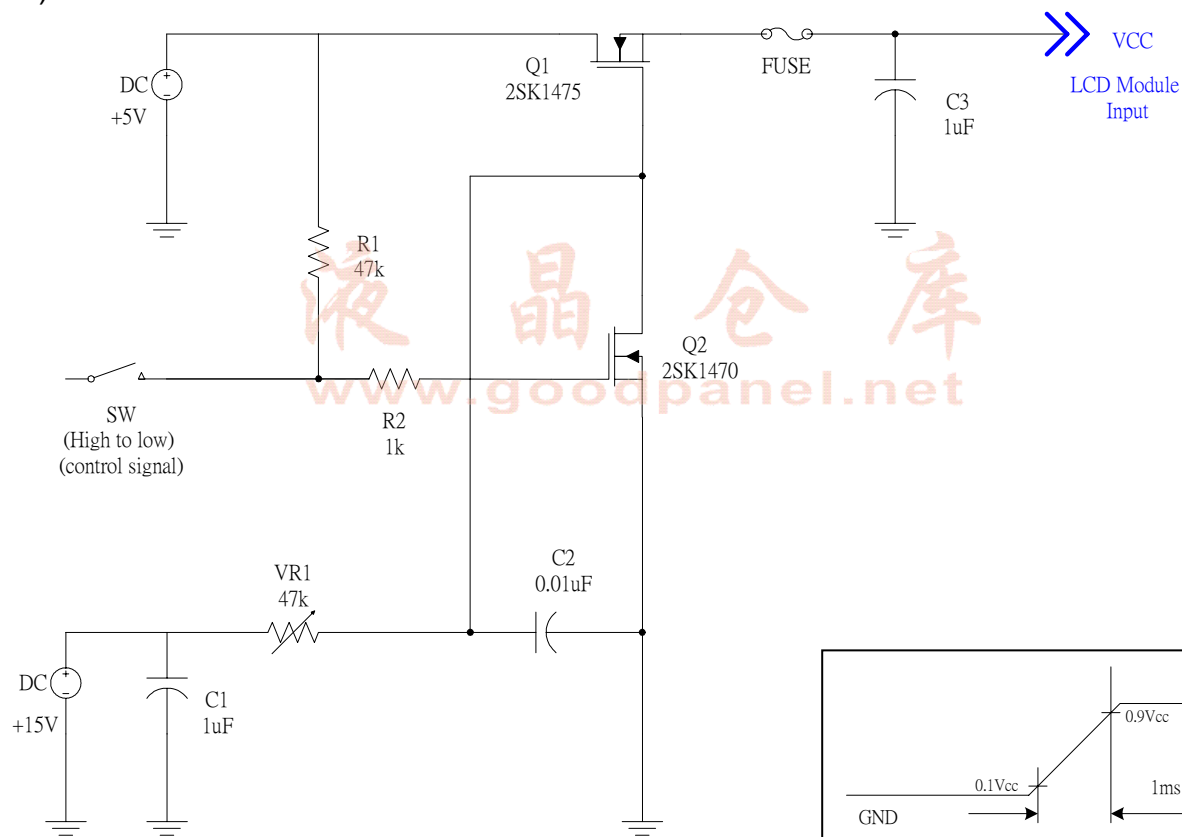
Ta=25

ITEM		SYMBOL	MIN	TYP	MAX	UNIT	REMARK
LCD Power Supply Voltage		VCC	11.4	12.0	12.6	V	*1)
Ripple Voltage		V _{rp}	--	--	100	mVp-p	VCC=+12.0V
Rush current		I _{rush}	--	--	4	A	*2)
LCD Power Supply Current	White	ICC	--	400	--	mA	*3)
	Black		--	300	--		
	RGB stripe		--	350	--		
LCD power consumption		P _c	--	5.0	8.0	W	
High input voltage of LVDS		V _{IN+}	--	--	100	mV	*4)
Low input voltage of LVDS		V _{IN-}	100	--	--	mV	
Input common voltage of LVDS		V _{CM}	--	1.25	-	V	
Input terminal resist of LVDS		R _T	--	100	--	ohm	

[Note]

*1) The module should be always operated within above ranges.

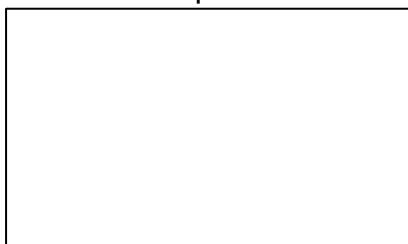
*2) Measure conditions:



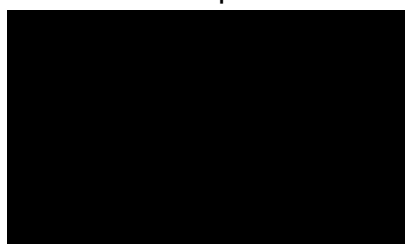
Vcc rising time is 1 ms

*3) The specified power supply current is under condition at $V_{cc}=12V$, $T_a=25\pm 2$, $f_v=60Hz$, whereas a power dissipation check pattern below is displayed.

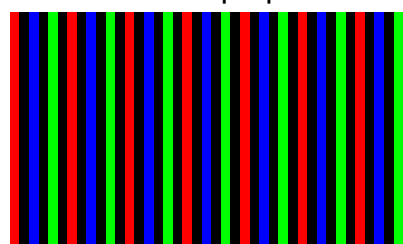
a. White pattern



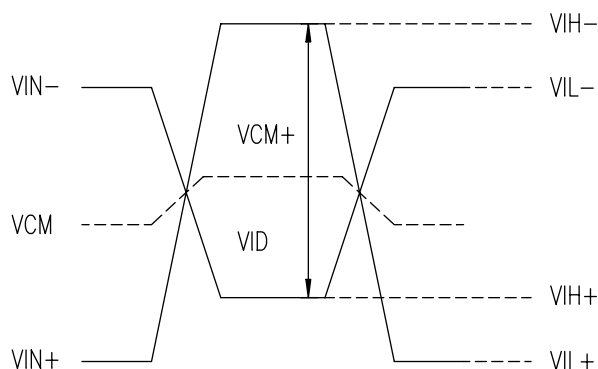
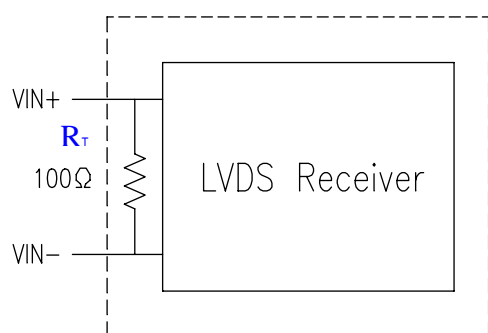
b. Black pattern



c. RGB Stripe pattern



*4) LVDS Signal Definition:



$$VID = VIN_+ - VIN_-$$

$$VCM = |VCM_+ - VCM_-|$$

$$VID = |VID_+ - VID_-|$$

$$VID_+ = |VIH_+ - VIH_-|$$

$$VID_- = |VIL_+ - VIL_-|$$

$$VCM = (VIN_+ + VIN_-) / 2$$

$$VCM_+ = (VIH_+ + VIH_-) / 2$$

$$VCM_- = (VIL_+ + VIL_-) / 2$$

VIN+: Positive Polarity differential DATA & CLK input

VIN-: Negative Polarity differential DATA & CLK input

3.2 POWER SEQUENCE :

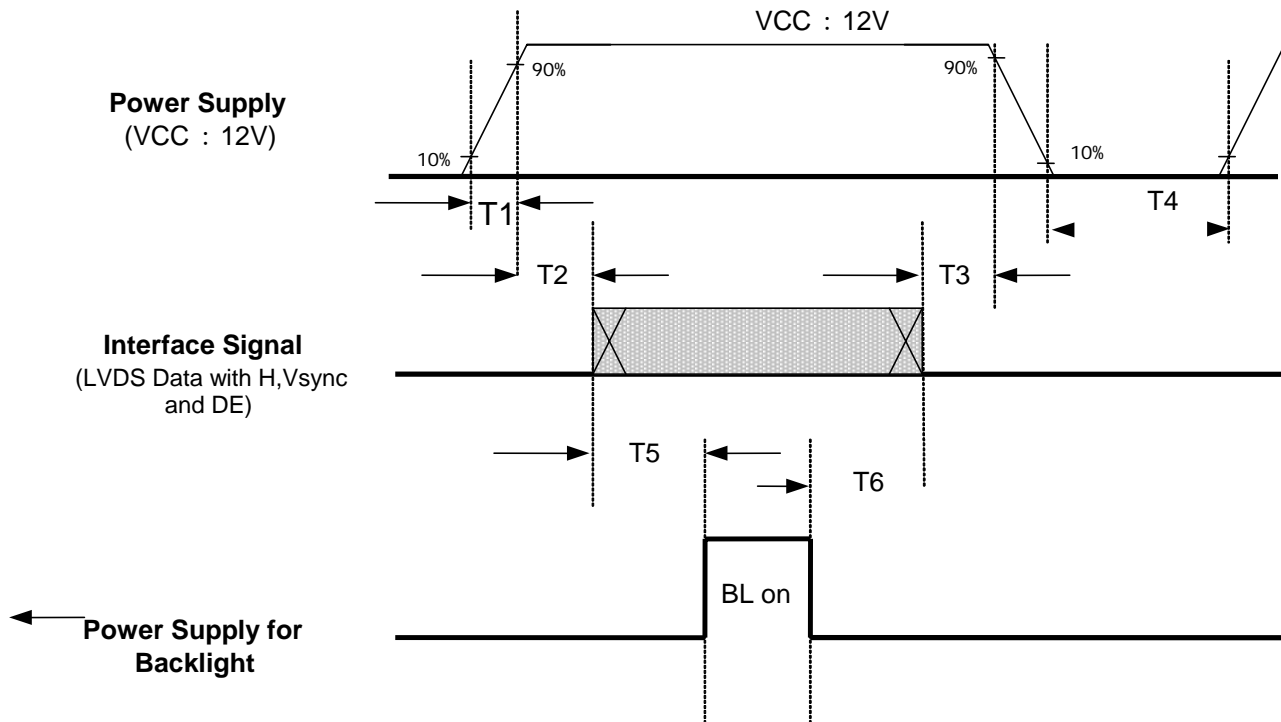


Table 1. Power Sequence :

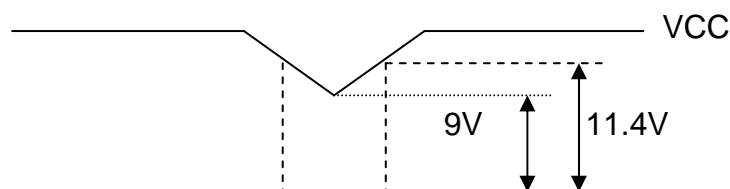
Parameter	Value			Unit
	Min	Typ	Max	
T1	1	---	30	ms
T2	0	---	50	ms
T3	1	---	50	ms
T4	2000	---		ms
T5	110	---		ms
T6	100	---		ms

Notes:

- *1) Please avoid floating state of interface signal at invalid period.
- *2) When the interface signal is invalid, be sure to pull down the power supply for LCD to 0V.
- *3) Lamp power must be turn off after power supply for LCD interface signal valid.

Table 2 . VCC-dip State:

- 1) When $9V < VCC < 11.4V$, $t_d = 10ms$.
- 2) $VCC > 11.4V$, VCC-dip condition should also follow the VCC-turn-off condition.

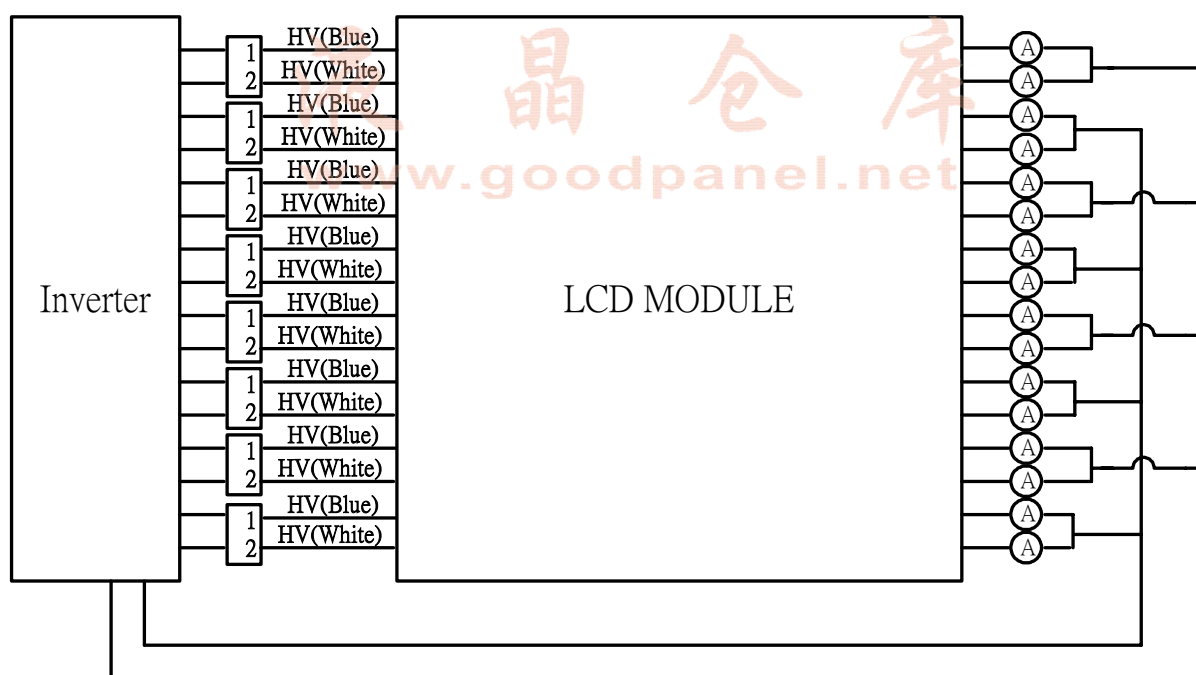


3.3 INVERTER AND LAMP SPECIFICATION FOR BACK LIGHTING

Ta = 25°C, VCC=12V ,Turn on for 30 minutes

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	REMARK
Lamp Life Time	LT	50000	--	--	hr	*1)
Input Voltage	VIN	21.6	24	26.4	V	*2)
Input Current	IIN	--	4.5	5.5	A	*3)
Internal Dimming Control Voltage	PDIM	0	--	3.3	V	*4)
External PWM Frequency	FDIM	100	--	350	Hz	
External PWM Dimming Control Voltage	PDIM	2.0	--	3.3	V	High *5)
	PDIM	0	--	0.8	V	Low *5)
PWM select Voltage	Vsel	2.0	--	3.3	V	High
	Vsel	0	--	0.8	V	Low
Duty Ratio	D	20	--	100	%	
ON/OFF Control Voltage	ON	ON/OFF	2.0	5.0	V	
	OFF		0	0.8		
Power Consumption (Backlight)	BLW	--	108	132	W	*3)

Definition of the (.) : The value is variation



[Note]

*1) Definition of the lamp life time :

When lamp luminance reduce to 50% or lower than its initial value.

*2) Ripple voltage that occur at the instant of power-on can't exceed 27V.

*3) Max value of the power consumption and input current is measured at initial turn on of the backlight.

*4) Internal PWM control with Analog input voltage.

Brightness is the darkest when $P_{DIM} = 0V$;

Brightness is the brightest when $P_{DIM} = 3.3V$.

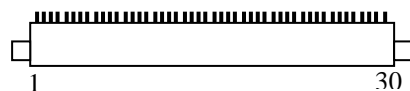
* 5) Duty Signal Input with 3.3V TTL specification.

液晶仓库
www.goodpanel.net

4. INTERFACE PIN CONNECTION

4.1 TFT LCD MODULE

(a).Connector Part No. : 20389-030E(I-PEX) or FI-X30SSL-HF(JAE) or compatible



Pin on	Symbol	Description	Note
1	VCC	+12V , DC , Regulated	
2	VCC	+12V , DC , Regulated	
3	VCC	+12V , DC , Regulated	
4	VCC	+12V , DC , Regulated	
5	GND	Ground	
6	OD SEL	OverDrive Look-up Table Selection	(2)
7	DE/Sync	DE/Sync Option	(3)
8	GND	Ground	
9	DMS	LVDS Option	(4)
10	NC	No Connection	(1)
11	GND	Ground	
12	RxIN0-	Data-	
13	RxIN0+	Data+	
14	GND	Ground	
15	RxIN1-	Data-	
16	RxIN1+	Data+	
17	GND	Ground	
18	RxIN2-	Data-	
19	RxIN2+	Data+	
20	GND	Ground	
21	RxCLKIN-	Clock-	
22	RxCLKIN+	Clock+	
23	GND	Ground	
24	RxIN3-	Data-	
25	RxIN3+	Data+	
26	GND	Ground	
27	NC	No Connection	(1)
28	NC	No Connection	
29	GND	Ground	
30	GND	Ground	

[Note] *1) Reserved for internal use. **Must be open.**

*2) PAL/NTSC Option

Frame Rate Select (Pin 6)	Frame Rate
GND	PAL (50Hz)
NC	NTSC(60Hz)

OD EEPROM need two if support both PAL and NTSC(option)

* 3) DE / Sync Option:

DE/Syncs(Pin 7)	Mode
GND	DE
NC	Sync

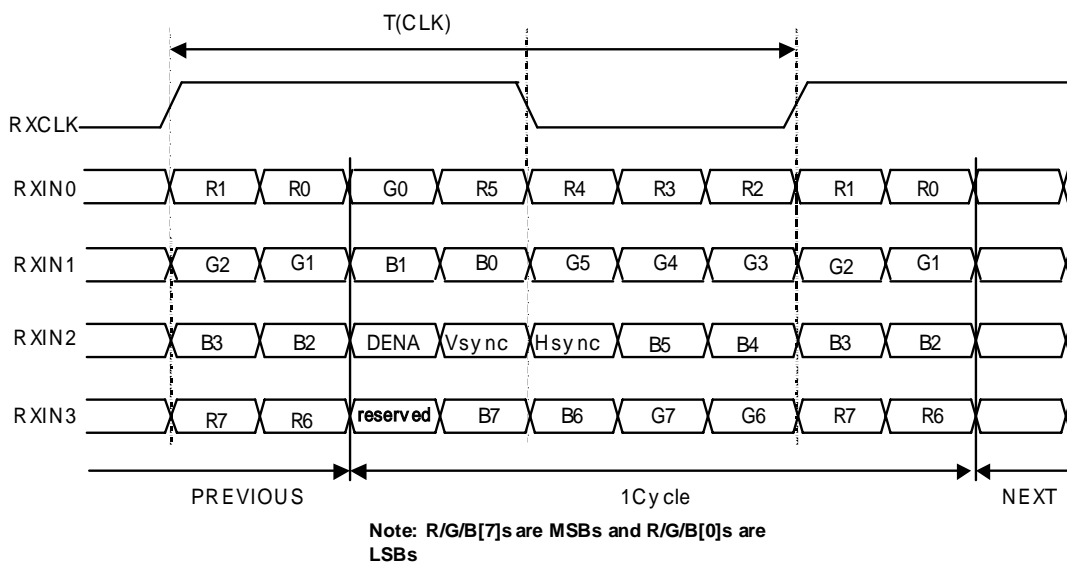
* 4) LVDS Option (DMS) :

DMS(Pin 9)	LVDS format
GND /Open	Non-JEIDA(Normal)
High(3.3V)	JEIDA

4.2 LVDS DATA MAPPING

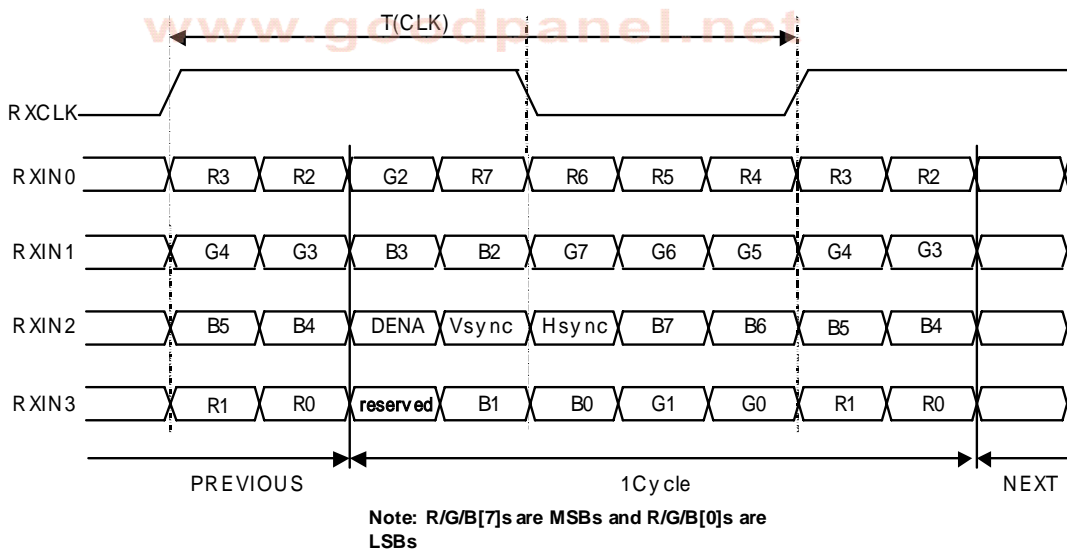
a. Pin 9 : GND/NC, Non-JEIDA mode

Non-JEIDA SPEC



b. Pin 9 : 3.3V, JEIDA mode

JEIDA SPEC



4.3 LVDS INTERFACE : LVDS Receiver : Tcon (LVDS Rx merged)

	LVDS pin	JEIDA-DATA	Non-JEIDA-DATA
TxOUT/RxIN0	TxIN/RxOUT0	R2	R0
	TxIN/RxOUT1	R3	R1
	TxIN/RxOUT2	R4	R2
	TxIN/RxOUT3	R5	R3
	TxIN/RxOUT4	R6	R4
	TxIN/RxOUT6	R7	R5
	TxIN/RxOUT7	G2	G0
TxOUT/RxIN1	TxIN/RxOUT8	G3	G1
	TxIN/RxOUT9	G4	G2
	TxIN/RxOUT12	G5	G3
	TxIN/RxOUT13	G6	G4
	TxIN/RxOUT14	G7	G5
	TxIN/RxOUT15	B2	B0
	TxIN/RxOUT18	B3	B1
TxOUT/RxIN2	TxIN/RxOUT19	B4	B2
	TxIN/RxOUT20	B5	B3
	TxIN/RxOUT21	B6	B4
	TxIN/RxOUT22	B7	B5
	TxIN/RxOUT24	Hsync	Hsync
	TxIN/RxOUT25	Vsync	Vsync
	TxIN/RxOUT26	DENA	DENA
TxOUT/RxIN3	TxIN/RxOUT27	R0	R6
	TxIN/RxOUT5	R1	R7
	TxIN/RxOUT10	G0	G6
	TxIN/RxOUT11	G1	G7
	TxIN/RxOUT16	B0	B6
	TxIN/RxOUT17	B1	B7
	TxIN/RxOUT23	Reserved	Reserved

4.4 INVERTER

Inverter – Connector :

1)Connector(Receptacle) : S14B-PH-SM3-TB(JST) or compatible.

2)Mating connector(Plug) : PRH-14(JST) or compatible.

Pin no	Symbol	Description	Note
1	VBL	Supply Voltage 24V	
2	VBL	Supply Voltage 24V	
3	VBL	Supply Voltage 24V	
4	VBL	Supply Voltage 24V	
5	VBL	Supply Voltage 24V	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	GND	Ground	
11	NC	NC (Test pin or else)	
12	ON/OFF	B/L On: NC /High(2.0~5.0V) B/L Off: GND (0~0.8V)	
13	PDIM	External PWM or Internal PWM with analog input (Min.:0V; Max: 3.3V)	(1)
14	Vsel	GND: External PWM Dimming (Pin 13) NC /High : Internal PWM with Analog input (Pin 13)	(2)

[Note] :

- *1) VDIM is External PWM control or Analog control input; i.e. External PWM should be able to control width of Voltage Burst of inverter output for Lamp Driving. This input can have two types of input; Ordinary default setting will be DC level signal using Saw Tooth Wave control for PWM duty control. The other setting is Duty Signal Input with 3.3V TTL specification. These two methods should be decided by 14th Pin input setting.
- *2) 14th Pin is selection pin for PWM control method; if this pin is connected to GND, PDIM input of 13th Pin should have Logic Level Duty Signal for PWM control. If this is set to High or NC, 13th Pin should have DC level signal.

5. INTERFACE TIMING

5.1 TIMING SPECIFICATION

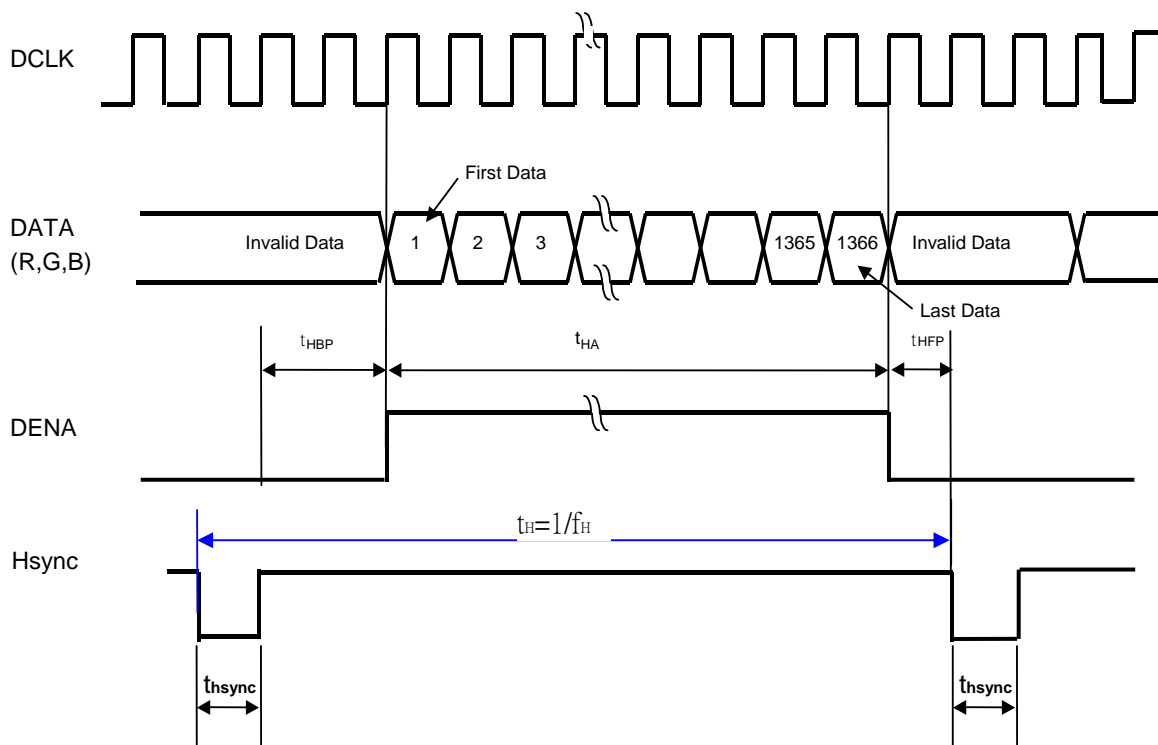
ITEM			SYMBOL	MIN.	TYP.	MAX.	UNIT	
LCD Timing	DCLK		Freq.	f _{CLK}	62	80	84	MHz
			Cycle	t _{CLK}	14.7	12.5	11.9	ns
	DENA Mode	Horizontal	Line Rate	f _H	37.1	48.6	56	kHz
			Horizontal Total Time	t _H	1575	1648	1936	t _{CLK}
			Horiaontal Effective Time	t _{HA}	1366	1366	1366	t _{CLK}
			Horizontal Blank Time	t _{HB}	209	282	570	t _{CLK}
		Vertical	Frame Rate	Fr	47	60	63	Hz
			Vertical Total Time	t _V	790	810	888	t _H
			Vertical Effective Time	t _{VA}	768	768	768	t _H
			Vertical Blank Time	t _{VB}	22	42	120	t _H
	Sync Mode	Horizontal	Horizontal Sync Time	t _{Hsync}	---	136	---	t _{CLK}
			Horizontal Back Porch	t _{HBP}	---	108	---	t _{CLK}
		Vertical	Vertical Sync Time	t _{Vsync}	---	5	---	t _H
			Vertical Back Porch	t _{VBP}	---	22	---	t _H

[Note]

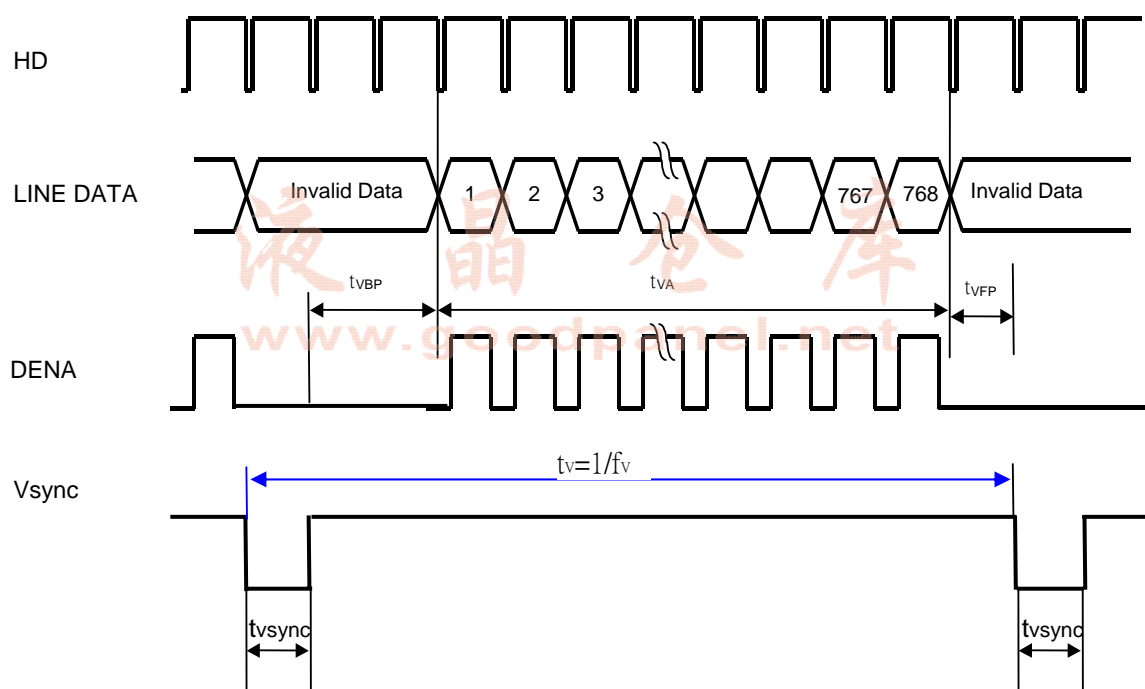
- *1). The best result of over-driving is in frame rate =60Hz.
- *2) PAL:47~53Hz ,NTSC:57~63Hz.
- *3) Vsync and Hsync should be keep the above specification.

5.2 TIMING CHART

a. Horizontal Timing



b. Vertical Timing Chart



5.3 COLOR DATA ASSIGNMENT

COLOR	INPUT DATA	B DAT8								G DAT8								R DAT8							
		B7	B6	B5	B4	B3	B2	B1	B0	G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0
		MSE								MSE								MSE							
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	RED(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(253)	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(254)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GREEN	GREEN(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	GREEN(253)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0
	GREEN(254)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	GREEN(255)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
BLUE	BLUE(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	BLUE(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1
	BLUE(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1

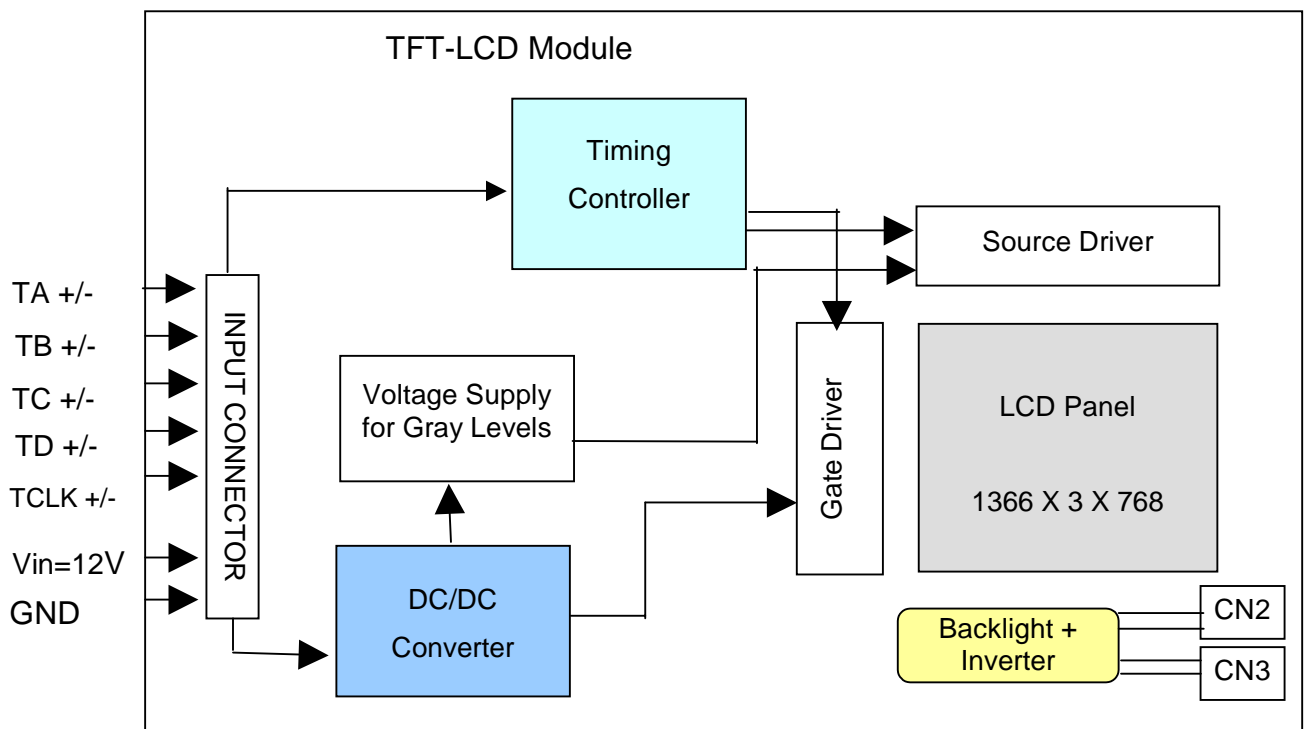
[Note]

*1) Definition of gray scale :

Color (n) : n indicates gray scale level , higher n means brighter level.

*2)Data : 1-High , 0-Low

6. BLOCK DIAGRAM



BACKLIGHT UNIT

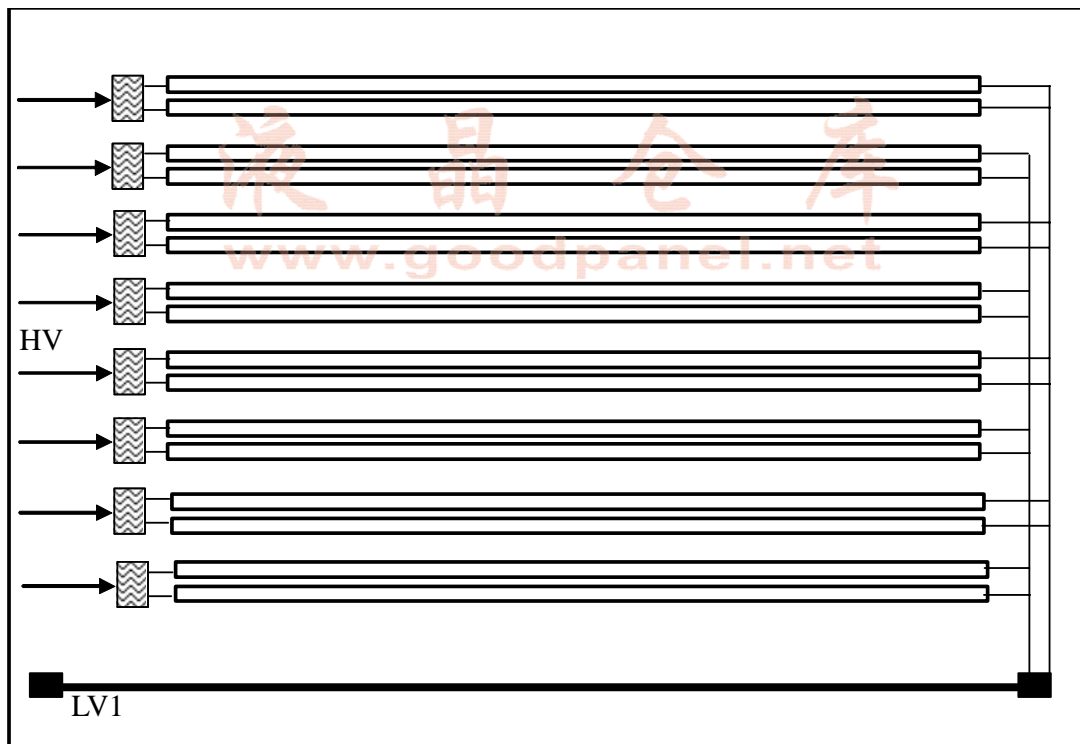
Lamp connector

HV : BHR-02VS-1(JST)*8 or compatible

Mating connector : SM02(8.0)B-BHS-1-TB(JST) or compatible

LV1 : BHR-02VS-1(JST)*1 or compatible

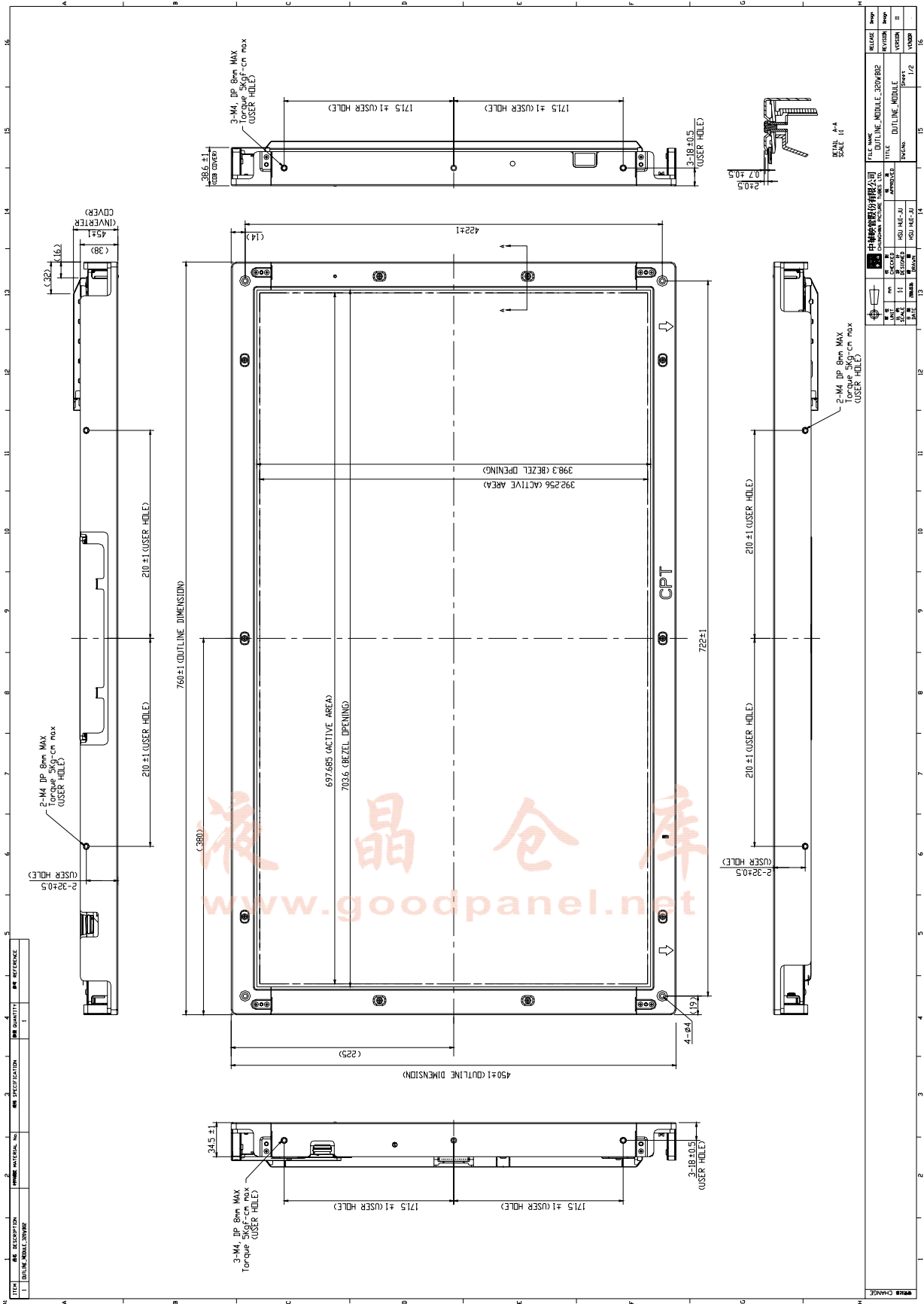
Mating connector : SM02(8.0)B-BHS-1-TB(JST) or compatible



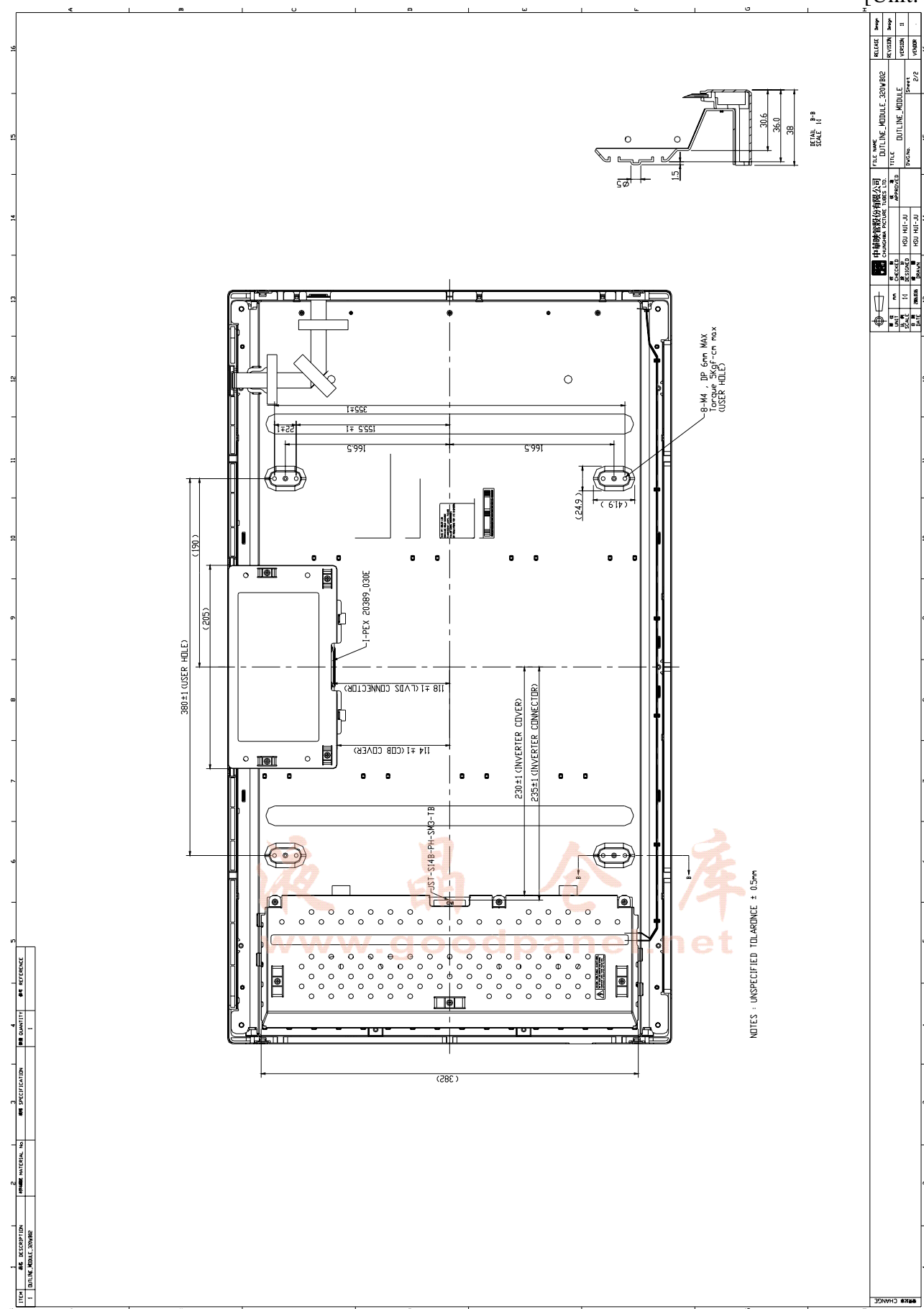
7. MECHANICAL SPECIFICATION

(1) Front side (include inverter , if the sizes of a panel don't show the differential value , please follow the values show as differential range table.)

[Unit: mm]



[Unit: mm]



8.OPTICAL CHARACTERISTICS

Ta = 25°C, VCC=12V ,Turn on for 30 minutes

ITEM				SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	Remarks
Contrast (CEN)				CR	$\theta = \psi = 0^\circ$ Point-5	800	1200	--	--	*1)*2)*3)
Luminance (CEN)	Central Luminance			$\theta = \psi = 0^\circ$	$\theta = \psi = 0^\circ$	450	550		cd/m ²	*2)*8)
	9P Luminance (AVG)			$\theta = \psi = 0^\circ$	$\theta = \psi = 0^\circ$		500	--	cd/m ²	*2)
	9P Uniformity	Dimming 100%		$\theta = \psi = 0^\circ$	$\theta = \psi = 0^\circ$	75	--	--	%	*2)
Response Time (White – Black)				tr	$\theta = \psi = 0^\circ$	--	10	17	ms	*3)*4)
				tf	$\theta = \psi = 0^\circ$	--	6	8	ms	*3)*4)
Response Time (Gray to Gray Average)				trg ,tfg	$\theta = \psi = 0^\circ$	--	8	15	ms	*5)
View Angle	Horizontal			ψ	$CR \geq 20$ Point-5	-80~80	-88~88	--	°	*2)*3)
	Vertical			θ		-80~80	-88~88	--	°	*2)*3)
Crosstalk Ratio				CMR	$\theta = \psi = 0^\circ$	--	--	4	%	*3)*6)
Color Temperature Coordinate	Red			R _x R _y	$\theta = \psi = 0^\circ$ Point-5	0.620 0.300	0.650 0.330	0.680 0.360	--	*2)*3)
	Green			G _x G _y		0.240 0.590	0.270 0.620	0.300 0.650		
	Blue			B _x B _y		0.115 0.040	0.145 0.070	0.175 0.100		
	White			W _x W _y		0.253 0.267	0.283 0.297	0.313 0.327		
Color Gamut				CG		--	75	--	%	*7)

Definition of the (.) : The value is variation

[Note]

These items are measured using : BM-5A (TOPCON)

View Angle : EZ contrast XL-88 , Response Time : Westar TRD-100

[under the dark room condition (no ambient light).]

Definition of these measurement items is as follows :

*1) Definition of Contrast Ratio :

CR=ON (White) Luminance/OFF (Black) Luminance

*2) Definition of Luminance and Luminance uniformity and Contrast and the Deviation of Color Coordinate :

Luminance and Contrast : To measure at the center position “5” on the screen (NO.5) , see Fig.8-1 below.

Luminance Uniformity : L_w (MAX) and L_w (MIN) are the maximum and minimum luminance value measure at the position “1~5” on the screen (NO.1~5) , see Fig.8-1 and below show equation :

$$\Delta L_w = [L_w(\text{MIN}) / L_w(\text{MAX})] \times 100\%$$

he Deviation of Color Coordinate : To measure at the position “1~9” on the screen (NO.1~9) , see Fig.8-1 below.

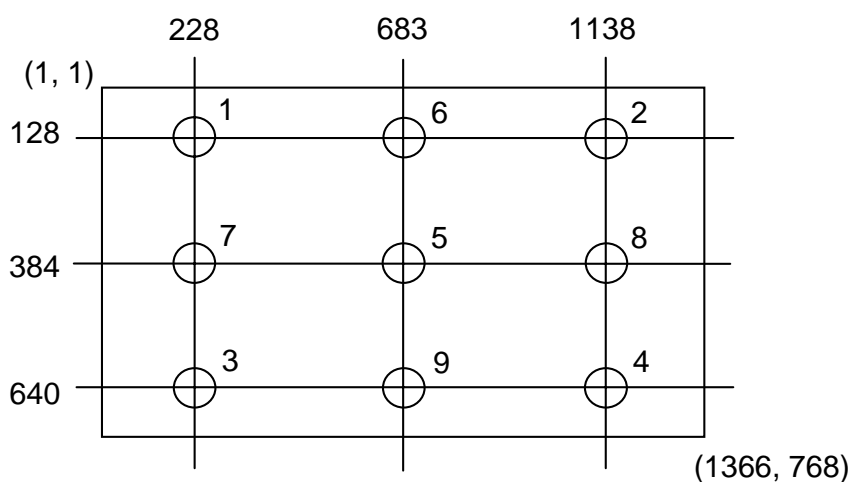


Figure 8-1. Measurement positions

*3) Definition of Viewing Angle (θ , ϕ) :

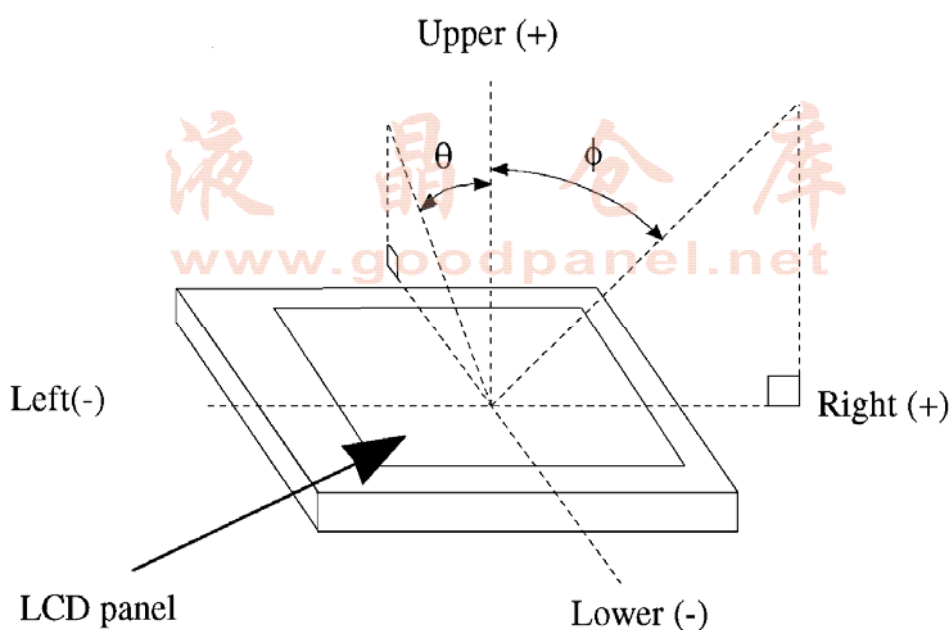


Figure 8-2. Definition of Viewing Angle

***4) Definition of Response Time (White – Black)**

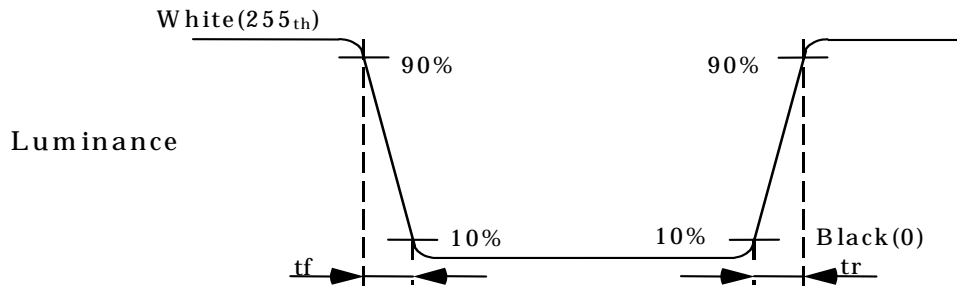


Figure 8-3. Definition of Response Time (White – Black)

***5) Definition of Response Time (Gray to Gray Average)**

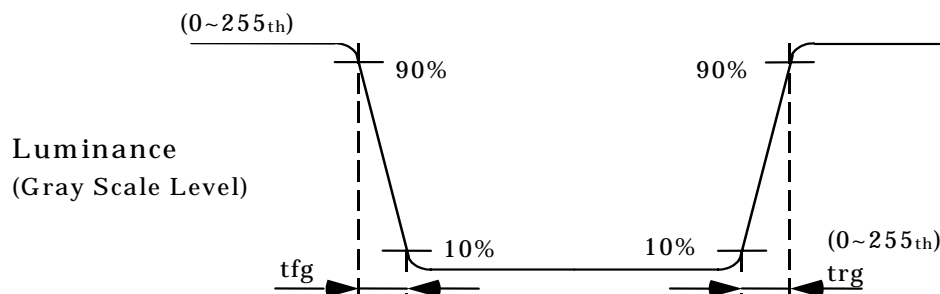


Figure 8-4. Definition of Response Time (Gray Scale Level)

The driving signal time means the signal of gray level 0、16、32、48、64、80、96、112、128、144、160、176、192、208、224、240、255.

Gray to Gray Average means the average switching time of gray level 0、16、32、48、64、80、96、112、128、144、160、176、192、208、224、240、255 to each other.

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 1 hour in a windless room.

液晶仓库
www.goodpanel.net

*6) Definition of Cross Talk Ratio :

$$CMR = \text{MAX} \left(\left(\frac{LB1 - LA}{LA} \right) \times 100\% , \left(\frac{LB2 - LA}{LA} \right) \times 100\% \right)$$

- LA : Pattern A(Half-Tone pattern) Measure point Luminance
- LB1 , LB2 : Pattern B1 、 Pattern B2 Measure point Luminance

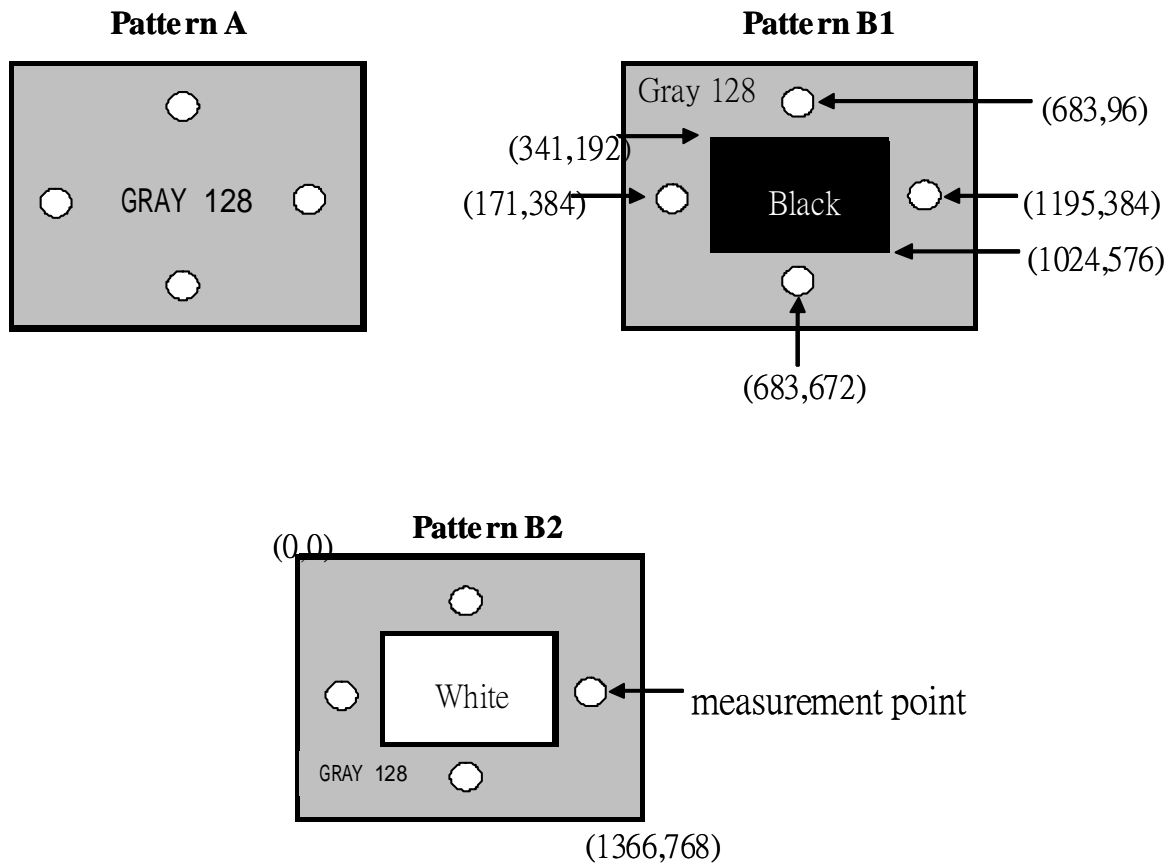


Figure 8-6. The pattern of cross talk test

*7) Definition of Color Gamut:

To measure RGB three sub-pixels color gamut coordinate at CIE coordinate chart from the center of module , to form a triangle area = A_{RGB} .

RGB three sub-pixels of NTSC at CIE coordinate chart to form a triangle area = N_{RGB} .

$$CG = \frac{A_{RGB}}{N_{RGB}} \times 100$$

*8) Definition of Central Luminance:

After lighting on the panel 30 mins, you can proceed the Central Luminance testing.

The definiton of Typ value is under status of **Inverter Dimming Voltage=3.3V.**

9.RELIABILITY

(1) Environment test condition

TEST ITEMS	CONDITIONS
High Temperature storage test	Ta=60°C 240 hours
Low Temperature storage test	Ta=-20°C 240 hours
High Temperature operation test	Ta=50°C 90%RH 240 hours
Low Temperature operation test	Ta=0°C 240 hours
Vibration Test (Non-Operating)	Waveform : Sinusoidal Vibration level : 9.8m/s ² (1.0G) zero to peak Frequency range : 10 - 300 Hz Duration : X,Y,Z, 10 min , total 30 mins One time in each direction
Shock Test (Non-Operating)	Shock level : 980m/s ² (100G) Waveform : half sinusoidal wave, 2ms Direction: ±X, ±Y, ±Z One time in each direction.

(2) Judgment standard

The judgment of the above test should be made as follow:

Pass: Normal display image with no obvious non-uniformity and no line defect.

Partial transformation of the module parts should be ignored.

Fail: No display image, obvious non-uniformity, or line defects.

液晶仓库
www.goodpanel.net

10.PACKAGING

10.1 PACKING SPECIFICATIONS

- (1) 3 LCD TV modules/1 Box
- (2) Box dimensions : 975(L) x 280(W) x 559(H)
- (3) Weight : approximately 29.6kg (3 modules per box)

10.2 PACKING METHOD

Figurs 1 and 2 are the packing method

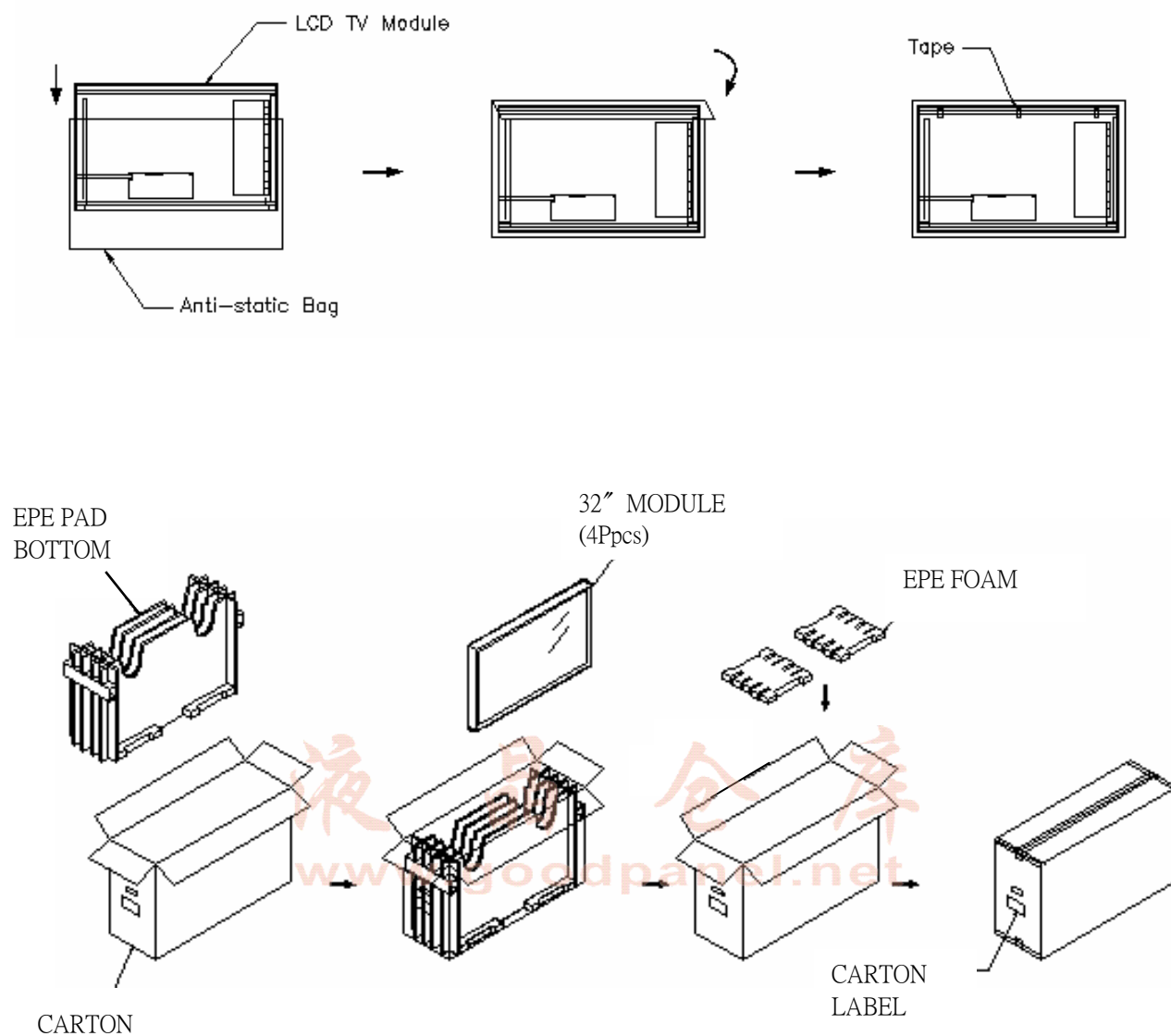
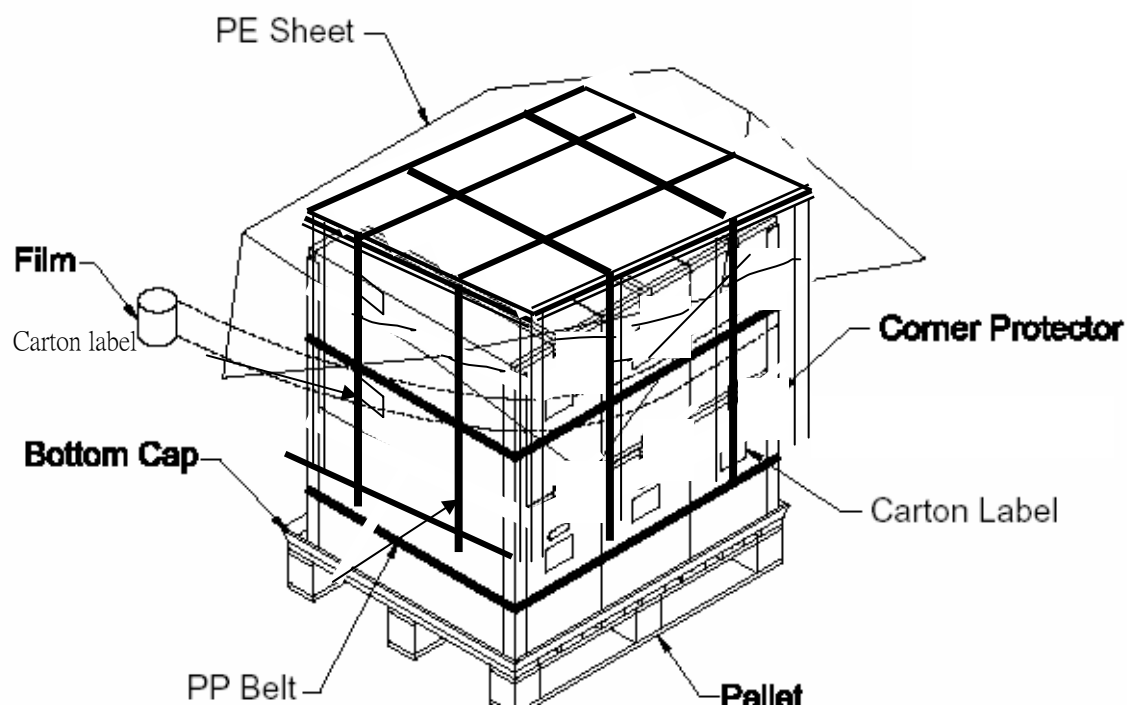


Figure 1 packing method

- (1) Corner protector : L1115 x 50mm x 50mm
- (2) Pallet : L1000 x W1150 x H130mm
- (3) Bottom Cap : 1000 x W1150 x H130mm
- (4) Pallet Stack : 1000 xW1150 x H1250mm
- (5) Gross : 251kg



液晶仓库
www.fpdclub.net

Figure2 packing method

11. DEFINITION OF LABELS

11.1 CPT Module Label

The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.

(a) LABEL :



- Model Name : CLAA320WB02

- Panel ID : XXXXXXXX XXX

_____ CPT Internal Use.

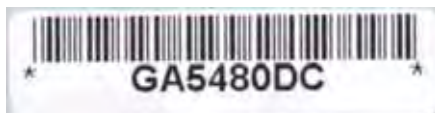
- Product date : X XX XXXX X XXX

_____ Customer NO.
 _____ Product Line.
 _____ Serial NO.
 _____ Week.
 _____ Year.

液晶仓库

www.goodpanel.net

(b) MODULE LABEL :



(c) B/L MAKER LABEL :



(d) Disposal label



11.2. Handling precaution

- (1) Don't disassemble and reassemble the module by self.
- (2) Acid, alkali, alcohol or touched directly by hand will damage the display.
- (3) Static electricity will damage the module. Please configure grounding device.
- (4) The strong vibration, shock, twist or bend will cause material damage, even module broken.
- (5) It is easy to cause image sticking while displaying the same pattern for very long time.
- (6) The response time, brightness and performance will vary from different temperature.
- (7) The inverter will cause high temperature and high voltage, be careful please.

液晶仓库
www.goodpanel.net

12. HANDLING PRECAUTIONS FOR TFT-LCD MODULE

Please pay attention to the followings in handling TFT-LCD products :

10.1 ASSEMBLY PRECAUTION

- (1) Please use the mounting hole on the module side in installing and do not beading or wrenching LCD in assembling. And please do not drop, bend or twist LCD module in handling.
- (2) Please design display housing in accordance with the following guidelines.
 - Housing case must be destined carefully so as not to put stresses on LCD all sides and not to wrench module. The stresses may cause non-uniformity even if there is no non-uniformity statically.
 - Keep sufficient clearance between LCD module back surface and housing when the LCD module is mounted. Approximately 1.0 mm of the clearance in the design is recommended taking into account the tolerance of LCD module thickness and mounting structure height on the housing.
 - When some parts, such as, FPC cable and ferrite plate, are installed underneath the LCD module, still sufficient clearance is required, such as 0.5mm. This clearance is, especially, to be reconsidered when the additional parts are implemented for EMI countermeasure.
 - Design the inverter location and connector position carefully so as not to give stress to lamp cable, or not to interface the LCD module by the lamp cable.
 - Keep sufficient clearance between LCD module and the others parts, such as inverter and speaker so as not to interface the LCD module. Approximately 1.0mm of the clearance in the design is recommended.
- (3) Please do not push or scratch LCD panel surface with any-thing hard. And do not soil LCD panel surface by touching with bare hands. (Polarizer film, surface of LCD panel is easy to be flawed.)
- (4) Please do not press any parts on the rear side such as source TCP, gate TCP, control circuit board and FPCs during handling LCD module. If pressing rear part is unavoidable, handle the LCD module with care not to damage them.
- (5) Please wipe out LCD panel surface with absorbent cotton or soft clothe in case of it being soiled.
- (6) Please wipe out drops of adhesives like saliva and water on LCD panel surface immediately. They might damage to cause panel surface variation and color change.
- (7) Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
- (8) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
- (9) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.

10.2 OPERATING PRECAUTIONS

- (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
- (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification.
- (3) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.
- (4) A condensation might happen on the surface and inside of LCD module in case of sudden change of ambient temperature.
- (5) Please pay attention to displaying the same pattern for very long time. Image might stick on LCD. If then, time going on can make LCD work well.
- (6) Please obey the same caution descriptions as ones that need to pay attention to ordinary electronic parts.

10.3 PRECAUTIONS WITH ELECTROSTATICS

- (1) This LCD module use CMOS-IC on circuit board and TFT-LCD panel, and so it is easy to be affected by electrostatics. Please be careful with electrostatics by the way of your body connecting to the ground and so on.
- (2) Please remove protection film very slowly on the surface of LCD module to prevent from electrostatics occurrence.

10.4 STORAGE PRECAUTIONS

- (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0 ~40 without the exposure of sunlight and to keep the humidity less than 90%RH.
- (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60 ~ 90%RH.
- (3) Please do not leave the LCDs in the environment of low temperature; below -20 .

10.5 SAFETY PRECAUTIONS

- (1) When you waste LCDs, it is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
- (2) If any liquid leaks out of a damaged-glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

10.6 OTHERS

- (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight and strong UV rays.
- (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
- (3) For the packaging box, please pay attention to the followings:
 - Packaging box and inner case for LCD are designed to protect the LCDs from the damage or scratching during transportation. Please do not open except picking LCDs up from the box.
 - Please do not pile them up more than 3 boxes. (They are not designed so.) And please do not turn over.
 - Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
 - Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

液晶倉庫
www.goodpanel.net